Mitsubishi General-Purpose Programmable Controller Renewal Tool

Conversion Adapter
Model
ERNT-ASQTD61

User's Manual

50CM-D180121-C(1409)

MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED
HEAD OFFICE:Hulic KUDAN BLDG.1-13-5, KUDANKITA CHIYODA-KU, TOKYO 102-0073, JAPAN
NAGOYA ENGINEERING OFFICE:139 SHIMOYASHIKICHO-SHIMOYASHIKI, KASUGAI, AICHI 486-0906, JAPAN

● SAFETY PRECAUTIONS ●

(Always read these precautions prior to use.)

Before using this product, please read this manual carefully and pay full attention to safety to ensure that the product is used correctly.
The precautions presented in this manual are concerned with this product only. For Programmable Controller system safety precautions, refer to the user's manual of the MELSEC-Q series CPU module to be used.
In this manual, the safety precautions are ranked as "WARNING" and "CAUTION."

⚠WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or minor injury and/or property damage.

Note that failure to observe the ⚠ CAUTION level instructions may lead to a serious consequence according to the circumstances. Always follow the precautions of both levels because they are important to personal safety.
Please keep this manual in an easy-to-access location for future reference, and be sure to provide the manual to the end user.

[Precautions before using]

⚠ CAUTION

- When making a switch from the MELSEC-AnS Series to the MELSEC-Q Series, be sure to consult user's manual supplied with individual module under the MELSEC-Q Series to confirm differences in various aspects including performance and function between the two series.

[Installation Precautions]

⚠ CAUTION

- Use the Conversion Adapter in the environmental conditions that are specified in the general specification. If the Products are used in any environment beyond the bounds of the general specification, electric shock, fire, malfunction, or damage to or degradation of the Products will result.
- Do not directly touch any conductive parts of Conversion Adapter. Contact will cause malfunction or failure in the system.
- Fasten the Conversion Adapter and the Mounting Bracket securely with retaining screws, and tighten the screws by applying torque within specified limits. Loose screws can lead to the dropping of the Conversion Adapter or Mounting Bracket, possibly causing breakage thereof. Excessive tightness of the screws can lead to breakage of the screws, Conversion Adapter, Mounting Bracket, or MELSEC-Q Series Module, possibly causing the dropping, shorting, and malfunction thereof.
- Always check for correct match between MELSEC-Q Series and the Conversion Adapter. Incorrect match can cause damage to the MELSEC-Q Series Module.
- When installing the Conversion Adapter, take care not to get your hand snagged on the Mounting Bracket or the like. Injury may result.
- When installing or removing the MELSEC-Q Series Module complete with a Converter Adapter, be sure to hold it with both hands. Dropping may lead to breakage.

[Wiring Precautions]

⚠ WARNING

- Before attempting to install the Unit or carry out the necessary wiring, make certain that the external power supply, used in the system, is shut off on all three phases. Failure to do so may result in electric shock or damage to the product.
- After installation and wiring, close the terminal block cover before turning on the module for operation. Failure to do so may result in electric shock.

[Wiring Precautions]

⚠ CAUTION

- Carry out wiring for the Conversion Adapter correctly after checking the specification and terminal arrangement for the module used. Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.
- Tighten the MELSEC-AnS Series terminal installation screws and terminal screw securely by applying torque within the specified limits. Loose screws will cause short circuit, fire or malfunction. Excessive tightening will damage the screws or the Conversion Adapter which in turn will cause dropping of parts, short circuit or malfunction.
- Use care to prevent foreign materials including cuttings and wiring debris from entering the Conversion Adapter or the MELSEC-Q Series Module. These will be cause for fire, failure or malfunction.

[Startup and Maintenance Precautions]

⚠ WARNING

- Do not touch live terminals. There is a danger of electric shock or malfunction.
- Shut off the external power supply for the system in all phases before cleaning or retightening the terminal screws. Failure to do so may result in electric shock or cause the MELSEC-Q Series module to fail or malfunction. Loose screws can lead to dropping, shorting, and malfunction. Excessive tightness of the screws can lead to breakage of the screws, Conversion Adapter, Mounting Bracket, or MELSEC-Q Series Module, possibly causing the dropping, shorting, and malfunction thereof.

⚠ CAUTION

- Do not modify the Conversion Adapter or take it apart. Doing so will cause failure, malfunction, personal injury, or fire.
- Do not drop the Conversion Adapter and Mounting Bracket or do not give a strong impact to it. This will cause damage.

[Disposal Precautions]

⚠ CAUTION

- When disposing of the product, treat it as industrial waste.

EMC AND LOW VOLTAGE DIRECTIVES

Compliance to the EMC Directive, which is one of the EU Directives, has been a legal obligation for the products sold in European countries since 1996 as well as the Low Voltage Directive since 1997.
Manufacturers who recognize their products are compliant to the EMC and Low Voltage Directives are required to declare that print a "CE mark" on their products.

Authorized representative in Europe

Authorized representative in Europe is shown below.
Name: Mitsubishi Electric Europe BV
Address: Gothaer Strasse 8, 40880 Ratingen, Germany

1. Overview

This manual provides information about the Conversion Adapter "ERNT-ASQTD61" available as Renewal Tools for the Mitsubishi General-Purpose Programmable Controller.
The Conversion Adapter is a product for effecting conversion to transcend difference in pin assignment between the MELSEC-AnS Series and the MELSEC-Q Series.
Before attempting to make a switch from MELSEC-AnS Series to MELSEC-Q Series in your installation, consult the user's manual supplied with individual module under the latter series to learn about how they differ in various aspects including performance and function.

Once you have opened the packaging, verify that it contains the following products.

Product	Quantity
Conversion Adapter	1
Mounting bracket	1
Mounting bracket fixing screw (M2.6×4)	2
Fixture installation screw (M3×8)	1
Terminal block cover	1
Short bar (spare parts)	1

2. General Specifications

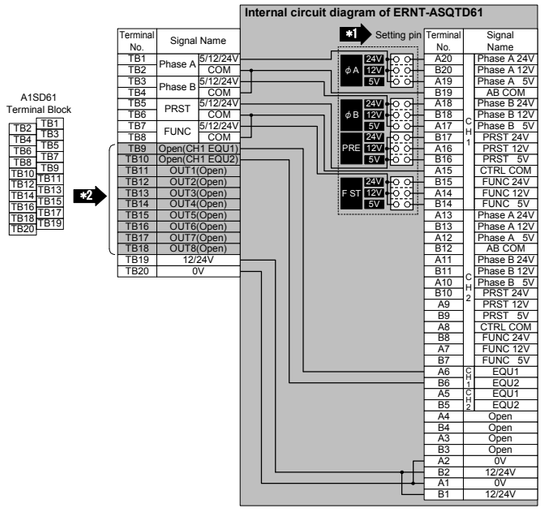
Item	Specifications					
Operating ambient temperature	0 to 55℃(Maximum surrounding air temperature 55℃)					
Storage ambient temperature	-25 to 75℃					
Operating ambient humidity	5 to 95%RH, non-condensing					
Storage ambient humidity						
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2	Under intermittent vibration	Frequency	Constant acceleration	Half amplitude	Sweep count
			5 to 8.4Hz	–	3.5mm	10 times each in X, Y, Z directions
			8.4 to 150Hz	9.8m/s^2	–	
		Under continuous vibration	5 to 8.4Hz	–	1.75mm	–
			8.4 to 150Hz	4.9m/s^2	–	
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147 m/s^2, 3 times each in 3 directions X, Y, Z)					
Operating atmosphere	No corrosive gases					
Operating altitude *1	0 to 2000m					
Installation location	Inside a control panel					
Overvoltage category *2	II or less					
Pollution degree *3	2					

*1 : Do not use or store under pressure higher than the atmospheric pressure of altitude 0m.
*2 : This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises.
Category II applies to equipment for which electrical power is supplied from fixed facilities.
*3 : This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.
Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

3. Product Specifications

For detail specifications which do not appear in the specification comparison charts contained herein, see the user's manual supplied with the MELSEC-Q Series module you use. Those parts of the specification that differ between the MELSEC-AnS Series and the MELSEC-Q Series are where a switch from the first series to the second is subjected to specification-related restrictions. Check the specification of the devices to be connected for more details.
Furthermore, it is recommended to refer to the "Transition from MELSEC-AnS/QnAS (Small Type) Series to Q Series Handbook (Intelligent Function Modules): L (NA)-08220ENG" issued by Mitsubishi Electric.

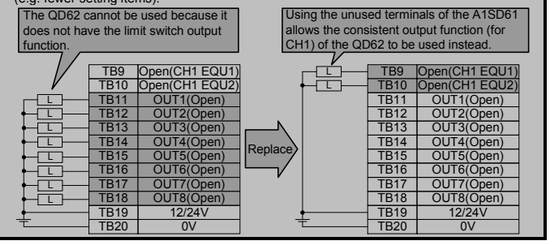
Conversion Adapter Model	MELSEC-AnS Series Model	No. of channels	MELSEC-Q Series Model	Conversion Adapter Weight (g)
ERNT-ASQTD61	A1SD61	1 channel	QD62 QD62-H01 QD62-H02	110



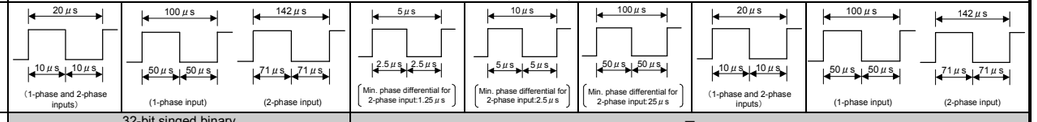
Precautions for wiring

*1 Set the pins of each signal(ϕA, ϕB, PRE, F ST) according to the input voltage.
The default input voltage for all signals is 24V(24V side).
24V Input: set to 24V side
12V Input: set to 12V side
5V Input: set to 5V side
Inputting a voltage higher than the one set using the setting pins may cause a failure in the MELSEC-Q Series module.

*2 The OUT1 terminal (TB11) to OUT8 terminal (TB18) cannot be used because the QD62, QD62-H01, and QD62-H02 do not have the limit switch output function of the A1SD61.
When using the consistent output function (EQU1 terminal (A6) and EQU2 terminal (TB10)) of the QD62, QD62-H01, and QD62-H02 instead, use the unused terminals (EQU1 terminal (TB9), EQU2 terminal (TB10)) of the A1SD61. The specifications are different (e.g. fewer setting items).


The QD62 cannot be used because it does not have the limit switch output function.
Using the unused terminals of the A1SD61 allows the consistent output function (for CH1) of the QD62 to be used instead.
TB9 Open(CH1 EQU1)
TB10 Open(CH1 EQU2)
TB11 OUT1(Open)
TB12 OUT2(Open)
TB13 OUT3(Open)
TB14 OUT4(Open)
TB15 OUT5(Open)
TB16 OUT6(Open)
TB17 OUT7(Open)
TB18 OUT8(Open)
TB19 12/24V
TB20 0V
Replace

< Specification comparison >

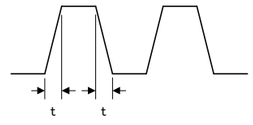
Specification \ Model	MELSEC-AnS Series		MELSEC-Q Series				
	A1SD61		QD62			QD62-H01	QD62-H02
Counting speed switch settings	Switch with the setting pins		Switch with the intelligent function module switch setting				
	50k	10k	200k (100k to 200kPPS)	100k (10k to 100kPPS)	10k (10kPPS or less)	50k	10k
Number of channels	1 channel		2 channels				
Count input signal: Phase	1-phase input, 2-phase input		1-phase input (1 multiple/2 multiples), 2-phase input (1 multiple/2 multiples/4 multiples), CW/CCW input				
Count input signal: Signal level (ϕA, ϕB)	5/12/24VDC 2 to 5mA						
Counter: Counting speed (max) 1-phase input	50kPPS	10kPPS	200kPPS *1	100kPPS *1	10kPPS *1	50kPPS *1	10kPPS *1
Counter: Counting speed (max) 2-phase input	50kPPS	7kPPS				50kPPS *1	7kPPS *1
Counter: Counting range	32-bit singed binary (-2147483648 to 2147483647)						
Counter: Model	UP/DOWN Preset counter + Ring counter function						
Counter: Minimum count pulse width (Duty ratio 50%)							
Limit switch output: Comparison range	32-bit singed binary		–				
Limit switch output: Comparison result	A contact operation: dog ON address ≦ count value ≦ dog OFF address B contact operation: dog OFF address ≦ count value ≦ dog ON address		–				
Coincidence output: Comparison range	–		32-bit singed binary				
Coincidence output: Comparison result	–		Set value < Count value, Set value = Count value, Set value > Count value				
Eternal input: Preset / Function start	5/12/24VDC 2 to 5mA						
External output: Limit switch output	Transistor (open collector) output 12/24VDC 0.1A/point 0.8A/common		–				
External output: Coincidence output	–		Transistor (sinking type) output 12/24VDC 0.5A/point 2A/common				
I/O occupied points	32 points		16 points				
Wiring connection system	20 point terminal block		40-pin connector				
Internal current consumption(5VDC)	0.35A		0.30A				

Make sure the ▭ section of the above table meets the specification of the machines and equipment connected to the MELSEC-Q Series module.

*1 : Counting speed is affected by pulse rise and fall time. Possible counting speeds are shown in the following table.
Note that if a pulse that has a large rise and /or fall time is counted, a miscount may occur.

Counting speed switch settings / Rise/fall time	QD62 Both 1-phase and 2-phase input 200k	100k	10k
t = 1.25μs or less	200kPPS	100kPPS	10kPPS
t = 2.5μs or less	100kPPS	100kPPS	10kPPS
t = 25μs or less	–	10kPPS	10kPPS
t = 500μs	–	–	500PPS

Counting speed switch settings / Rise/fall time	QD62-H01 Both 1-phase and 2-phase input 50k	QD62-H02 1-phase input 10k	QD62-H02 2-phase input 10k
t = 5μs	50kPPS	10kPPS	7kPPS
t = 50μs	5kPPS	–	–
t = 500μs	–	500PPS	250PPS



Precautions for the program

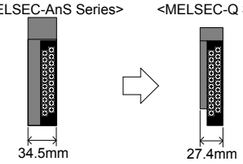
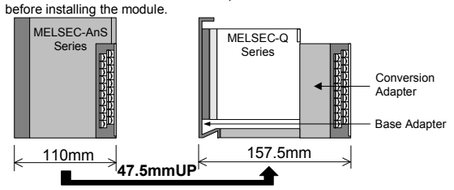
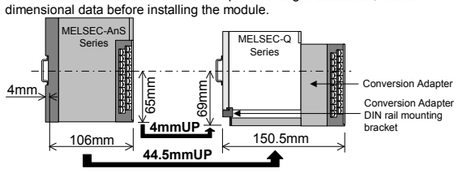
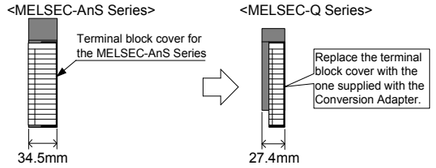
1. A1SD61 and QD62/QD62-H01/QD62-H02 differ from each other in the way input/output signals (X, Y) and buffer memory addresses are allocated. Therefore, you need make necessary changes to the sequence program that is used.
2. Change the sequence program because the limit switch output function of the A1SD61 is replaced by the consistent output function of the QD62.
3. Use the I/O signal (X, Y) and buffer memory addresses of CH1 in the QD62, QD62-H01, and QD62-H02. If CH2 is used, the modules do not operate.
4. Set the counting speed using the intelligent function module switch setting in the QD62, QD62-H01 and QD62-H02 instead of the setting pins that are used in the A1SD61.

4. Mounting and Installation

4.1 Handling Precautions

(1) Before attempting to install the Unit or carry out the necessary wiring, make certain that the external power supply, used in the system, is shut off on all three phases. Failure to do so may result in electric shock or damage to the product.
(2) Do not touch live terminals. There is a danger of electric shock or malfunction.
(3) Do not modify the Conversion Adapter or take it apart. Doing so will cause failure, malfunction, personal injury, or fire.
(4) Do not touch the energized part of the Conversion Adapter directly. Contact will cause malfunction or failure in the system.
(5) The protective wrap is used to protect your hands from touching the conductive part in the pin-setting process. Peel it off after finishing the settings. In addition, make sure to peel it off before installing a MELSEC-AnS Series terminal block.
(6) Fasten the Conversion Adapter and the Mounting bracket securely with retaining screws, and tighten the screws by applying torque within specified limits. Loose screws can lead to the dropping of the Conversion Adapter, or Mounting bracket, possibly causing breakage thereof. Excessive tightness of the screws can lead to breakage of the screws, Converter Adapter, Mounting bracket or MELSEC-Q Series Module, possibly causing the dropping, shorting, and malfunction thereof.
(7) Use care to prevent foreign materials including cuttings and wiring debris from entering the Conversion Adapter or the MELSEC-Q Series Module. These will be cause for fire, failure or malfunction.
(8) Do not drop the Conversion Adapter and Mounting Bracket or do not give a strong impact to it. This will cause damage.

4.2 Use Precautions

Item	Use Precautions
Width dimension of module	Because the module is reduced in width dimension (34.5mm→27.4mm) and thus in area available for wiring, check dimensional data before installing the module. <MELSEC-AnS Series> <MELSEC-Q Series> 
Depth and Height dimension	Installation with the Base Adapter Because the module is increased in depth dimension, check dimensional data before installing the module.  Installation with the DIN rail Because the module is increased in depth and height dimension, check dimensional data before installing the module. 
Terminal block cover	The terminal block cover for MELSEC-AnS Series is bigger than the width of the MELSEC-Q Series Module. Therefore, it is necessary to replace it with the terminal block cover supplied with the converter adapter. <MELSEC-AnS Series> <MELSEC-Q Series> 

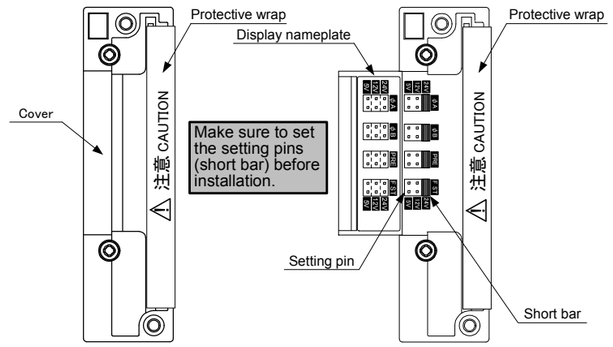
4.3 Installation Environment

For details of the installation environment, refer to the user's manual of the MELSEC-Q series CPU module to be used.

5. Preparation before Installation

5.1 Position of the setting pins

Open the cover of the Conversion Adapter, and you will find the setting pins to switch the input signal voltage.



Setting pin	Description	Factory setting
ϕA	Set the input voltage for A-phase pulse.	24V
ϕB	Set the input voltage for B-phase pulse.	
PRE	Set the input voltage for Preset input.	
F ST	Set the input voltage for Function start input.	

About the protective wrap

It is used to protect your hands from touching the conductive part in the pin-setting process.
(1) Peel it off after finishing the settings.
(2) Make sure to peel it off before installing a MELSEC-AnS Series terminal block.

5.2 How to set the setting pins

Set the input voltage for each signal using the short bar.
The short bar can be installed from any direction.

Signal \ Voltage	5V	12V	24V (Factory setting)
ϕA			
ϕB			
PRE			
F ST			

Notice

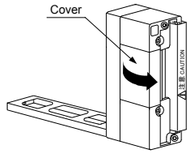
Incorrectly setting the setting pins will cause a failure and malfunction. Make sure to set them correctly.

5.3 Procedure

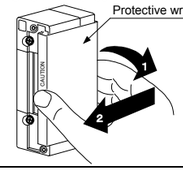
1 Open the cover.

2 Set the setting pins (short bar) as necessary.
Insert the short bar all the way into the setting pins in place till it can not be moved.

3 Make sure they have been set correctly and close the cover.

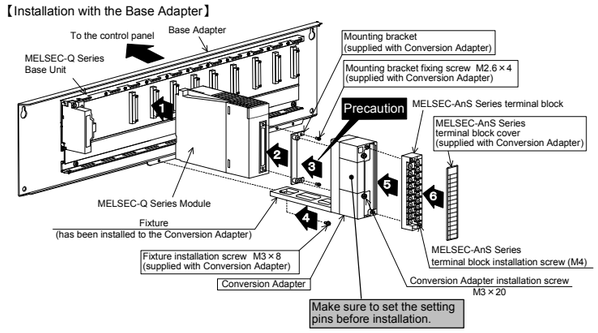


4 Hold the protective wrap with its rear side towards the right and peel it off towards yourself before installing a MELSEC-AnS Series terminal block.

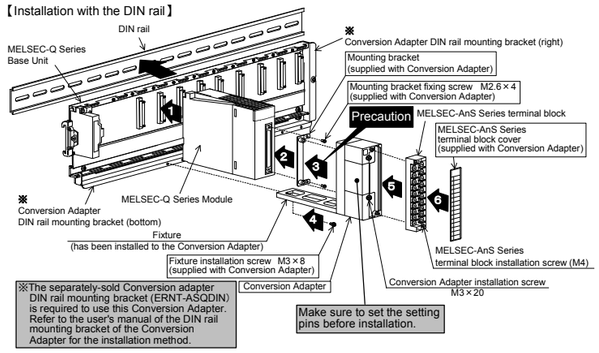


6. Part Names and Installation Method

【Installation with the Base Adapter】



【Installation with the DIN rail】



6.1 Installation Method

Installation with the Base Adapter

Mount the MELSEC-Q Series Base Unit to the Base Adapter. Refer to the Base Adapter's manual for how to install them to the control panel.

Installation with the DIN rail

Mount the MELSEC-Q Series Base Unit to the DIN rail mounting bracket of the Conversion Adapter and the adapters for DIN rail installation manufactured by Mitsubishi Electric.
For how to mount them to the DIN rail, refer to the user's manual of the Conversion Adapter DIN rail mounting bracket and QCPU.

1. Mount the MELSEC-Q Series module to the MELSEC-Q Series Base Unit.
2. Secure the Mounting Bracket to a compatible module under the MELSEC-Q Series with Mounting Bracket fixing screws (M2.6 x 4). (2 places)
3. Install the Conversion Adapter to the MELSEC-Q Series module, and secure it with the Conversion Adapter installation screws (M3×20). (2 places)

   Precaution

   Before tightening the installation screws, check that the Conversion Adapter has been securely installed on the MELSEC-Q Series module. Tightening the screws in floating-off state or tilting state will damage the Conversion Adapter installation screws and the mounting bracket.
4. Secure the fixture to the Base Adapter or Conversion Adapter DIN rail mounting bracket (bottom) of the Conversion Adapter with fixture installation screws (M3 x 8). (1 place)
5. Secure the MELSEC-AnS Series terminal block to the Conversion Adapter with the supplied terminal block installation screw (M4). (2 places, top and bottom.)
6. Remove the terminal block cover from the MELSEC-AnS Series terminal block and fit the terminal block cover supplied with the Conversion Adaptor in place.

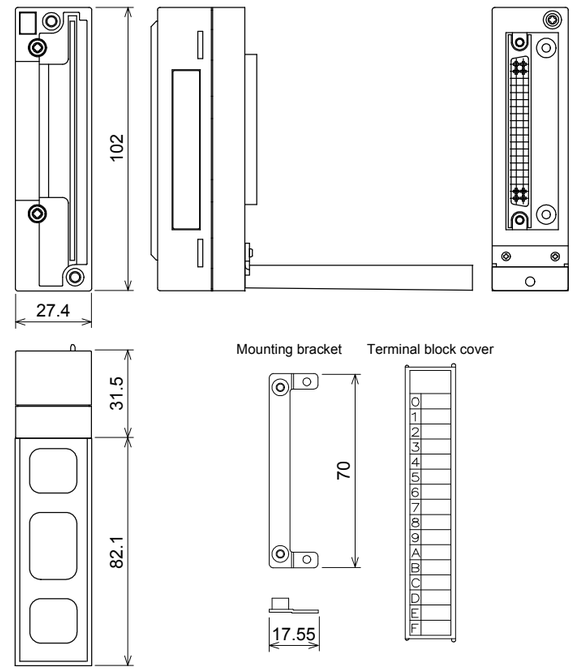
6.2 Tightening Torque

Tighten the module installation screws to the specified torque below. An inappropriate tightening torque could cause the product to fall or result in a short circuit, product failure or malfunction.

Screw Location	Tightening Torque Range
Mounting bracket fixing screw（M2.6×4）	0.20 to 0.29N·m
Conversion Adapter installation screw (M3×20)	0.43 to 0.57N·m
Fixture installation screw (M3×8)	0.61 to 0.82N·m
MELSEC-AnS Series terminal block installation screw (M4 screw)	0.78 to 1.18N·m

7. External Dimensions

Unit:mm



Product Warranty Details

Please confirm the following product warranty details prior to product use.

Gratis Warranty Terms and Gratis Warranty Range

If any fault or defect (hereinafter referred to as "Failure") attributable to Mitsubishi Electric Engineering Company Limited (hereinafter referred to as "MEE") should occur within the gratis warranty period, MEE shall repair the product free of charge via the distributor from whom you made your purchase.

Gratis Warranty Period

The gratis warranty period of this product shall be one (1) year from the date of purchase or delivery to the designated place.
Note that after manufacture and shipment from MEE, the maximum distribution period shall be six (6) months, and the gratis warranty period after manufacturing shall be limited to eighteen (18) months.
In addition, the gratis warranty period for repaired products shall not exceed the gratis warranty period established prior to repair.

Gratis Warranty Range

The gratis warranty range shall be limited to normal use based on the usage conditions, methods and environment, etc., defined by the terms and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

Warranty Period after Discontinuation of Production

(1) MEE shall offer product repair services (fee applied) for seven (7) years after production of the product has been discontinued. Discontinuation of production shall be reported via distributors.
(2) Product supply (including spare parts) is not possible after production has been discontinued.

Exclusion of Opportunity Loss and Secondary Loss from Warranty Liability

Regardless of the gratis warranty period, MEE shall not be liable for compensation for damages arising from causes not attributable to MEE, opportunity losses or lost profits incurred by the user due to Failures of MEE products, damages or secondary damages arising from special circumstances, whether foreseen or unforeseen by MEE, compensation for accidents, compensation for damages to products other than MEE products, or compensation for other work carried out by the user.

Changes in Product Specifications

The specifications given in the catalogs, manuals and technical documents are subject to change without notice.

This document is a new publication, effective September 2014. Specifications are subject to change without notice.

Developed September 2014
50CM-D180121-C